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AMERICAN
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COÖPERATION BETWEEN ACADEMIC AND OFFICIAL STATISTICIANS.*

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After I had gladly accepted the invitation to address you this morning on the subject of coöperation between academic and official statisticians, I was requested to represent the Royal Statistical Society on this anniversary occasion and to convey to you their appreciation of your work in the past and their good wishes for your future. This naturally led me to consider the original connection between the British and the American societies with the idea of making it at least an introduction to my main theme. But the circumstances surrounding the birth of the British society are so little known on this side of the Atlantic and so significant in their bearing upon the origin of our own association that I have decided to state them in detail even at the cost of abbreviating what at first I had planned to say. The two themes are not so unrelated as might at first appear, because in my opinion it is or should be the main function of a statistical society to foster coöperation between academic and governmental statisticians.

The formation of the American Statistical Association was one result of a general interest in the establishment of statistical societies which reached its climax between 1830 and 1840 and may be traced in France, Germany, Italy, and the United States, but was nowhere so strong as in England, where special conditions gave it a notable development. In that country the British Association for the Advancement of Science had been formed in 1831, and two years later it had constituted a statistical section; in the same year, 1833, the Manchester Statistical Society was organized; in 1834 the Statistical Society of London, now the Royal Statistical

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*Address at the Seventy-fifth Anniversary Meeting of the American Statistical Association, Boston, Mass., February 14, 1914.

Society, was founded; and before 1840 similar bodies had been established in Bristol, Glasgow, Liverpool, Belfast, Birmingham, Boston, and possibly New York. All of these associations had similar objects and a similar organization and sprang from a common impulse. Most of them had an ephemeral life; only three of them are still active, two of which, the Royal Statistical Society and the American Statistical Association, are the oldest national statistical societies in the world.

The development of English statistics has been closely associated with the English Royal Society, the greatest of all scientific associations past or present and the cradle of modern statistics. During the last half of the seventeenth century and the first forty years of its life, the work of three Fellows of the Royal Society, John Graunt, William Petty, and Edmund Halley, laid the foundations of that political arithmetic which was later with comparatively little change of content to be rechristened with the German name *statistics*.

Shortly before the societies with which we are now concerned were founded, the Royal Society fell for a time upon evil days, dissensions within and attacks without. Grave accusations against the administration were published but led to no investigation.* Two parties developed in the society and came to a trial of numerical strength at the election of 1830, when the reforming element supported for the presidency the great mathematician and astronomer, John Herschel, and the conservative element supported the Duke of Sussex. After great interest had developed and an unprecedented number of votes had been cast, the election resulted by a very narrow margin in favor of the conservative candidate, the Duke of Sussex.

Among Herschel's ardent supporters was Charles Babbage, who was more responsible perhaps than any other Englishman for the foundation of the Statistical Society of London. In a book, *On the Decline of Science in England*, published in 1830, Babbage had strongly criticised the constitution of the Royal Society, and at about the same time another member of the reforming party, David Brewster, suggested "an association of our nobility, clergy, gentry and philosophers" on a more democratic basis. A year after the defeat of the reforming element in the Royal Society, this suggestion of Brewster's bore fruit in the organization of the British Association for the Advancement of Science. It was avowedly an imitation of the Society of German Naturalists and Physicians, which had been formed in 1822 in execution of a suggestion from Oken and which a few years later had gained great prestige from the judicious support of the kings of Bavaria and Prussia and the reputation of its president, the most distinguished of living scientists, Alexander von Humboldt. No doubt the spirit of reform which found expression in the continental revolutions of 1830 and the English reform bill of 1832 was a potent influence in support of the new movement out of which the British Association sprang.

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* "The Society (sc. The Royal Society) has for years been managed by a *party* or *coterie*. . . . The great object of this, as of all other parties, has been to maintain itself in power, and to divide, so far as it could, all the good things amongst its members." Charles Babbage, *Reflections on the Decline of Sciene in England* (London, 1830), p. 141.

Another factor contributed directly and powerfully to the early recognition of statistics by the British Association. During the decade of which I am speaking Quetelet was probably the most widely known and was rapidly becoming the most distinguished of living statisticians. He had published his first essay in this field in 1826 and in various papers printed during the following years he had shown the regularity with which crimes occurred in different areas and recurred in successive years, and had thus laid the basis not only for what is sometimes called moral statistics, but also for that general view of social life and action which at first he called social mechanics and later social physics. In 1833 Quetelet went to England to attend the Cambridge meeting of the British Association* and carried with him a budget of statistical facts for which the organization of the meeting could provide no place.† This difficulty led his friend, Charles Babbage, one of the three trustees of the new Association, to suggest the formation of a new section on statistics, and one was hastily improvised with Babbage as chairman but without the usual authorization of the Central Committee. In explanation of this procedure, the president of the Association‡

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*British Association, *Reports*, III (1833), 484.

†Wm. Farr in *Journal of the Statistical Society*, XXXIV, (1871) 412.

‡Rev. Adam Sedgwick, professor of geology at Cambridge University, and not William Whewell, as one authority has it.

in his concluding address said that, in addition to the regular five sections, "another had come into operation, the object of which was to promote *statistical* inquiries. It had originated with some distinguished philosophers, but could not be regarded as a legitimate branch of the Association till it had received the recognition of the governing body; there could be little doubt, however, that the new Section would obtain the sanction of the General Committee with some limitation perhaps of the specific objects of inquiry."* The sanction and the limitation thus foreshadowed found expression when the General Committee approved the formation of a Statistical Section and resolved "that the inquiries of this Section should be restricted to those classes of facts relating to communities of men *which are capable of being expressed by numbers, and which promise, when sufficiently multiplied, to indicate general laws.*"†

This limitation was apparently designed to prevent the statistical section from being led astray into the speculations of economics and the controversies of politics.‡ It was a direct, although probably an unintentioned challenge of Quetelet's opinion. Four years before he had written: "Among the data of statistics are some which can be expressed in figures and others which cannot. To use only one of these kinds of data is to see only one side of statistics."§ Naturally enough, Quetelet considered that the resolution of the General Committee took "too limited a view of the functions and objects of statistical inquiry"|| and he suggested to Babbage the organization of a separate statistical society. The suggestion was adopted and the Statistical Society of London formed in 1834.¶

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*British Assn., *Reports*, III (1833), xxviii.

†British Assn., *Reports*, III (1833), XXXVII. The italics are in the original.

‡Intern. Stat. Institute, *Bulletin*, I, pts. i and ii, (1886) 41.

§A. Quetelet, *Recherches statistiques sur le royaume des Pays-Bas*, (1829), Introduction, p. iv, in *Mémoires de l'Académie de Belgique*, V. Compare Quetelet's definition of statistics, "The representation of a State at a given point of time," quoted in Royal Stat. Soc., *Journal*, Jubilee vol., 8.

||Mouat, in Royal Stat. Soc., *Journal*, Jubilee vol., 15.

¶Fifty years later the same antagonism of opinion regarding the scope of statistics was still acute. At the Jubilee meeting held to commemorate the fiftieth anniversary of the founding of the Statistical Society of London, the president in his opening address proposed as a definition of statistics "the science which treats of the structure of human society" and rejected the narrower definition "the science of social facts expressed in numbers." *Idem*, 8.

At the same period and as a result of the same movement, initial steps were taken towards organizing at least two American statistical societies, the New York Statistical Society and the American Statistical Association. The New York society was the earlier, having been incorporated in 1836 and its charter amended in 1839. It was frankly modelled upon the Statistical Society of London.* Its original charter provided for a capital stock of $50,000 and that the society should commence operations when the full amount had been subscribed and $5,000 paid in. Three years later the act was amended by allowing the society to commence operations immediately, but I have found no record that it did so.

The beginnings of the American Statistical Association are shrouded in obscurity. No direct connection between it and the Statistical Society of London has been demonstrated. At the meeting of this Association six years ago President Wright said: Whether the founding of the Statistical Society of London "inspired the organization of this Association, I cannot say but it is safe to assume that this was the case."† That judgment seems to me warranted by the evidence. The sequence in time, the similarity in name and in form of organization, the use by our society at the start of the English term *Fellow* instead of the then usual American term *member* are straws suggesting but in no wise proving the connection. In its Annual Report made in 1842 the Council of the Statistical Society of London wrote: "The Council . . . are much gratified in stating that the Constitution of the Society has served as a model for the American Statistical Association which has been established at Boston, United States."‡ Perhaps stronger evidence in favor of that conclusion may be found in the statement regarding our Association's field and aim which it published in 1840 and republished three years later as the preface to the first volume of its *Collections*. The opening and the closing sentences of that statement are quo-

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*"In the important city of New York a Statistical Society has been appointed and established by the Legislature of that State; and the Council feel gratified in reporting that the principles and regulations which form its Constitution have been avowedly adopted from those of the Statistical Society of London." Stat. Soc. of London, *Journal*, I (1838), 8. See also, Silliman's *Am. Journal of Science and Arts*, XXXII (1837), 202. New York Laws 1836: Chap. 495, and 1839: Chap. 193.

†Am. Stat. Assn., *Quart. Pub.*, XI (1908–09), 1.

‡Stat. Soc., *Journal*, V (1842), 89.

tations from the first few pages of the first volume of the *Journal of the Statistical Society of London* and yet to the careless reader that fact would not be apparent. No quotation marks are used about the first sentence and only an indefinite reference is given in the footnote. Although quotation marks are used about the last sentence, no other reference to the source is made than the introductory words, "In the language of a kindred institution." Can the writer have thought it inadvisable to emphasize the extent of his obligation to an English society?

However that may be, the "Address put forth by the Association at the period of its first establishment in the year 1840" differs in one important respect from the corresponding statements in the *Journal of the Statistical Society of London.* It draws heavily upon some unidentified German source for facts regarding the history of statistics in Germany and Sweden, and the position of that subject at the time our Association was organized not only in those countries but also in France and Italy, and it intersperses brief references to the main writers on statistics. The German cast of this part of the "Address" and its seemingly deliberate omission of any reference to the English writers on Political Arithmetic, who were mentioned by its English predecessor, show that the writer regarded the statistics which our society was to cultivate as the creation mainly of German scholars. Looking back from the vantage ground reached after seventy-five years of history, it seems fair to say that in this respect the "Address" put forth by our founders was true to the facts.

For the historians of statistics are now well agreed that the study we cultivate sprang from two main roots, one in the German universities, the other in English studies of political arithmetic. The former developed, under the name of statistics, a descriptive political science almost devoid of figures but systematic and suitable for presentation in academic lectures or treatises. The latter developed, under the name of political arithmetic, a series of fragmentary and disconnected studies of available numerical data. Between 1730 and 1830 the English ideas slowly penetrated Germany, introducing numerical data and gaining especially from Süssmilch a systematic, orderly presentation quite alien to their original form.

During the same period the German name *statistics* spread to England and this country. Probably the first writer to make it at home in English was Sir John Sinclair whose voluminous *Statistical Account of Scotland* exercised a traceable influence on both sides of the Atlantic. He wrote in 1798: "In the course of a very extensive tour through the northern parts of Europe which I happened to take in 1786 I found that in Germany they were engaged in a species of political inquiry to which they had given the name of Statistics and . . . as I thought that a new word might attract more public attention I resolved on adopting it and I hope that it is now completely naturalized."* The earliest occurrence of *statistics* in English was in 1770 and thus more than fifteen years before Sinclair, when Dr. Hooker published a translation of Bielfeld's *Elements of Universal Erudition.* One of its chapters is entitled Statistics and contains a definition of the subject as "The science that teaches us what is the political arrangement of all the modern states of the known world."† With this German name came also some of the German fondness for system and for breadth of treatment, and all these factors contributed to the establishment of English and American statistical societies. The statistics which were thus to be studied came much nearer to the German prototype than to the English political arithmetic.

This sketch of the origin of English and American statistical societies suggests, though I would not claim that it establishes, certain conclusions which a more thorough study of their history would probably substantiate.

1. Local statistical societies have been more short-lived than national statistical societies. Of the numerous English local societies only that of Manchester survives. We may regard our society's ambitious name as having been favorable to its permanence. Had it called itself the Boston Statistical Society or the Massachusetts Statistical Society, its chance of survival would have been less.

*Sinclair, *Stat. Account of Scotland,* XX, xiii.

†Hooker's, Bielfeld, *Elements of Universal Erudition,* III, Chap. XIII, 269.

2. Statistical societies established at the capital of a country have had a better opportunity to grow than similar societies established elsewhere. The Paris Statistical Society has long since outstripped the older Grenoble Statistical Society and has become in fact, though not in name, the statistical society of France; the statistical society of London, in recognition of its actual status and its fifty years of work was privileged in 1887 to change its name to The Royal Statistical Society; the Frankfort Association for Geography and Statistics, though founded in 1836, is of secondary importance.

3. The modern tendency is to make statistical societies peripatetic. This is almost necessarily true of international organizations like the Congresses of Statistics, the Congresses of Hygiene and Demography, and the International Statistical Institute; it is true of all three German statistical associations, namely, the Association of Imperial and State Governmental Statisticians, the Union of German Municipal Statisticians, and the German Statistical Society; of recent years our own Association has amended its charter with this object in view.

4. It is often wise for a statistical society to affiliate temporarily or permanently with other scientific societies. But its best connections lie with societies devoted to economics, political science, and law rather than with the natural or physical sciences. The economic and statistical sections of the British Association for the Advancement of Science and of the American Association for the Advancement of Science have had a checkered career and have at times been viewed askance by the parent organizations. The contrast between the origin of the British Statistical Society in 1834 as an offshoot from the statistical section of the British Association and the origin of the German Statistical Society in 1910 as a section of the German Sociological Society illustrates the change in this particular in seventy-five years. Hence our tendency to hold our recent annual meetings in connection with those of the economic, sociological, and historical associations seems in accord with the general trend.

5. A local statistical society exerts a strong influence in creating or maintaining sound work in statistics. When one thinks of the pioneer work of Shattuck, Jarvis, Walker,

Wright, Abbott, and Dike, to mention only the dead, and of the long years during which the censuses and the registration reports of Massachusetts have trained men or furnished models for other states and the country, one cannot but feel that the American Statistical Association with its headquarters in this city has materially aided in giving Massachusetts its historic position of leadership in American statistics.

6. The main end of the earlier statistical societies was the cultivation of statistics in the sense of Quetelet's early definition, "The representation of a State at a given point of time,"* or, in other words, a description of a country or locality expressed so far as possible in numerical terms, and, in pursuit of that end, if the needed material did not exist, the statistical society sought to gather it by independent inquiry. Thus, the fourth Annual Report of the Council of the Statistical Society of London describes the work of the following committees: (1) A committee to inquire into the state of education in London; (2) A committee to gather statistics of strikes and combinations in the United Kingdom; (3) A committee to gather statistics regarding population, births, marriages, and deaths; (4) A committee to gather statistics regarding crime. The laborious character of such work and the tendency of the government to take it over were important influences tending to limit the activities and shorten the days of these societies.

7. The main end of statistical societies like ours is or should be to furnish a center around which official statisticians and private statisticians may meet and fraternize. There has long been some danger that these two groups might work at cross purposes, the producer of statistics resenting the criticism of private students who have sometimes been ignorant and content to remain ignorant of the real difficulties besetting the path of the official and whose criticisms in consequence have been unintelligent or unjust, the user of statistics condemning the output of an office because it does not meet his needs or satisfy his special requirements. Statistics, unlike economics or sociology, is an art, a profession, as well as a science and is often, perhaps usually, guided quite as much by

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*Quoted by Rawson W. Rawson in Stat. Soc., *Journal*, Jubilee vol., p. 8.

administrative as by scientific aims. Not that the truth is wrested or concealed, but that the whole truth can never be ascertained and that part which is presented must be determined mainly by the needs of administration. To further this end the meetings of a statistical society are far more important than its publications.

This review of the past history and present condition of statistical societies naturally leads to the question of coöperation between academic and official statisticians. Most of the larger American institutions offering statistical courses lay stress upon laboratory practice. The real laboratory is an adjacent statistical office, just as the real laboratory for a medical school is a hospital, and university courses in statistics on the practical side are likely to be somewhat dilettante until both university course and statistical office are so modified that they can work together to mutual advantage. When a university offering a course in statistics is situated in or near a great city or a state capital, it should be or become possible for the teacher to present and interpret the statistics of that city or state. This could be done to greater advantage, if the teacher of statistics were officially connected with the public office or the government statistician were given a university appointment. Such relations have been common in continental countries. I need only mention Dieterici, Engel and Boeckh at Berlin, Hermann and von Mayr at Munich and Neumann-Spallart, Inama-Sternegg, von Juraschek and Mischler at Vienna. The importance of this suggestion leads me to quote a few sentences regarding the statistical seminars of Engel at Berlin and of Inama at Vienna. Of the seminar which Engel started at Berlin after he had been made Director of the Prussian Statistical Bureau Blenck wrote:

"In November, 1862, he opened a statistical seminar in which the theory and technique of statistics and the interrelations between statistics, administration and legislation were investigated and statistical theses written in connection with the current work of the Bureau. This seminar proved of great educational value to many young men who afterwards devoted themselves to administration or were appointed to chairs for political science and statistics in the German universities. Among these were Meyer, Oncken, Schönberg, Knapp, Held, Brentano, Cohn and Elster. High officials, members of the legislature, or persons connected with foreign embassies in Berlin were among the regular attendants."*

At Vienna in the 70's there had been a seminar in connection with the Central Statistical Commission. Inama transferred it to the University. It rendered the double service of training university students in the science of statistics and utilizing statistics as a method of gaining scientific knowledge. Under Inama's leadership from 1882 to 1905 it gained an international reputation and trained a great number of distinguished statisticians. Almost all the professorships of statistics in Austrian universities are held by men trained in it and many important works have originated there. In this way a statistical school has grown up, extending and continuing the ideas of the head.†

As evidence that such work is needed I may also quote a resolution adopted at the ninth and last International Statistical Congress: "The Congress believes that the teaching of theoretical statistics at the universities should be supported by practical conferences and that to secure this result statistical libraries should be formed in connection with departments of statistics and statistical bureaus should, if possible, establish connections with teachers of statistics, although entire independence should be assured to each side."‡

Work of this sort, I believe, is more needed in the United States today than any other line of statistical development. Perhaps the nearest approach to it that we have ever had was the group of young men who gathered around Carroll D. Wright during the twenty years when he was at the head of the Federal Bureau or Department of Labor. Since the retirement of Mr. Wright, no one in Washington has done work of this description. Neither in the Census Bureau nor in any of the smaller statistical offices is there an opportunity to get a training in statistics which would qualify one to rise to the most important statistical positions there or elsewhere.

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*Free and abridged translation from Intern. Stat. Inst., *Bulletin*, X, pt. ii (1897), 141.

†Free and abridged translation from von Juraschek in *Stat. Monatschrift*, XXXII (1906), 12.

‡Inama-Sternegg in *All. Stat. Archiv*, I (1890–91), 16, footnote.

This is the more important because the rapid development of public health work and of vital statistics as tributary to it is creating a demand for men trained in demography, which neither our bureaus nor our universities are doing much to fill. It might be said in reply that even the highest positions are not yet thought to demand professional training or held on a secure and permanent tenure. But the objection is not unanswerable. Is not the true relation one of interdependence? Is not the lack of a public demand for professional standards among official statisticians due in the main to public ignorance of the added significance and value a well trained man can give to statistical inquiries and their results? If so, are not the men best able to create this demand the private scholars and teachers of statistics? Is not the best method for them to follow that of constructive criticism of current statistical inquiries and interpretation of their results beyond the point at which they are left by the office which issues them?

In many university courses in statistics, laboratory exercises are included, but there is apparently no agreement regarding the scope and character of these exercises. In my opinion they should, if possible, be given definiteness and practical significance by being used to criticise or interpret the statistical results obtained in communities in which the class is interested. This might be the university community, the town or city in which the university is located or the student lives, or even the state as a whole. I cannot but feel that there may be some danger of turning the attention of the class too exclusively either to graphic methods of representing results or to mathematical methods of determining the exact degree of correlation. Doubtless each of these has a place and an important place in a course of statistics, but neither strikes at the spot in which most errors are found, namely, the original returns. In studying tuberculosis, for example, to make elaborate corrections for differences in the age and sex distribution of the population and of decedents in successive periods and to pass in silence the question of the comparative accuracy of diagnosis at the different dates is to strain at a gnat and then swallow a camel. For a large majority of statistical errors are those which creep into the raw material and cannot be eliminated by any refinements of mathematical analysis or any skill in graphic representation. To center attention on these field errors has the incidental advantage of bringing home to the student as nothing else can the real difficulties before the official statistician and of fostering that mutual understanding and sympathy between teachers and officials so necessary for hearty, continuous coöperation.

If I am right in my opinion that the best service the American Statistical Association can render to the progress of statistics is by bringing together for purposes of friendly discussion and coöperation the producers and consumers of statistics, then perhaps the future policy of the Association might be modified in order better to secure that end. Would it be well for us to try the experiment of establishing standing committees like those which did good work in the early years of the London Statistical Society? Perhaps committees on Federal work, on state work and on municipal work might be helpful. Perhaps a committee on the teaching of statistics might be organized, or a committee on infant mortality. Certainly our society should not follow the position of the economic or sociological societies and confine its work in the main to papers and discussions not ripening into recommendations. Our main duty is to improve Federal, state, and municipal statistics in the United States, and this we should hope to do not only by the example of our members but also by the precept of formal recommendations.